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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Shinichi NISHIDA, et al.

Appln. No.: 08/960,224

Confirmation No.: 5658

Filed: October 29, 1997

For: ACTIVE MATRIX LIQUID CRYSTAL DISPLAY PANEL

Docket No: Q46916

Group Art Unit: 2871

Examiner: Qi, Zhi Qiang

SUBMISSION OF APPELLANT'S BRIEF ON APPEAL

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an original and two copies of Appellant's Brief on Appeal. A check for the statutory fee of $330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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WASHINGTON OFFICE
23373
CUSTOMER NUMBER

Date: December 2, 2003

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APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Commissioner for Patents
Washington, D.C. 20231

Sir:

The following comprises the Appellants' Brief on Appeal from the final rejection dated May 5, 2003, rejecting claims 1-15. This Appeal Brief is filed in triplicate and is accompanied by a Submission which includes the required appeal fee set forth in 37 C.F.R. § 1.17(f). Appellants' Notice of Appeal was filed on October 2, 2003. Therefore, the present Appeal Brief is timely filed.

I. REAL PARTY IN INTEREST

Appellants respectfully submit that one half of the entire right, title and interest in the above-captioned application is assigned to NEC CORPORATION, a company organized under the laws of Japan, and that the remaining one half of the entire right, title and interest in the above-captioned application is assigned to NEC LCD Technologies, Ltd., a company organized under the laws of Japan.

II. RELATED APPEALS AND INTERFERENCES

Appellants state that, upon information and belief, Appellants are not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

This is an appeal from the final rejection dated May 5, 2003, wherein claims 1-5 were rejected.

The present application was filed on October 29, 1997 with claims 1-15. Claims 1, 3 and 5 were amended in Amendment Under 37 C.F.R. §1.111 filed February 11, 1999 (with claims 3 and 5 rewritten in independent form. Claim 1 was further amended in an Amendment Under 37 C.F.R. §1.116 filed September 19, 2001 (entered upon filing of a CPA on October 18, 2001) and further amended in an Amendment filed October 16, 2002 with an RCE. No amendments were made to the application after the October 16, 2002 Amendment.

Accordingly, claims 1-15 (see attached Appendix) are the claims currently on appeal from the final rejections set forth in the final Office Action dated May 5, 2003.

IV. STATUS OF AMENDMENTS

All of the Amendments noted in section III above have been entered.

V. SUMMARY OF THE INVENTION

Appellants' invention is in the field of active matrix liquid display panels where liquid crystal is held between transparent insulating substrates, and provides an active matrix liquid crystal display apparatus of the transverse electric field driven type having a good display characteristic free from coloring from whichever direction the display apparatus is viewed. (Appellants' specification, page 1, lines 3-7 and page 26, lines 4-8).

In accordance with one of the aspects of the invention as illustrated in Figs. 11(a) and 11(b) there is provided an active matrix liquid crystal display panel, comprising a first glass substrate 10 on which a plurality of color layers 6, 7 and 8 having transmission wavelengths different from each other are provided in parallel to each other, a second glass substrate 10 disposed in an opposing relationship to the first substrate, and a liquid crystal layer 4 formed from liquid crystal injected in a gap defined by a surface of the first substrate adjacent the second substrate and a surface of the second substrate adjacent the first substrate. The electric field generated by the second substrate is substantially parallel to the liquid crystal layer 4 to control a display. The liquid crystal layer 4 having a thickness which varies depending upon the transmission wavelengths of the color layers, whereby coloring is controlled in a case of an oblique view with respect to the first substrate and the second substrate. The second substrate 10 comprises a plurality of pixel electrodes 3 provided corresponding to the color layers 6, 7 and 8, and a plurality of opposing electrodes 2 provided in parallel to the pixel electrodes 3 for each of the color layers 6, 7 and 8 for cooperating, when a voltage is applied to the pixel electrodes 3, with

the pixel electrodes 3 to generate the electric field therebetween. Maximum brightness for each of R,G,B is gained by applying different driving voltages to the pixel electrodes, depending upon the thickness of the crystal layers dR, dG, dB in each of the color layers, wherein larger voltage is applied to each of the pixel electrodes 3 for the color layers with thinner liquid crystal layer to get maximum brightness for each color. (Appellants' specification, page 43, lines 3 through page 47, line 2)

In accordance with another aspect of the invention, as further illustrated in Figs. 13(a) and 13(b), the distances between a pixel electrode 3 and an opposing electrode 2 is different a pixel 20 corresponding to green and a pixel 21 corresponding blue. That is, pixel electrodes and opposing electrodes are spaced from each other by distances which are different for the individual color layers. (See Appellants' specification, page 47, line 4-22).

In accordance with another aspect of the invention, as explained with reference to Fig. 14, liquid crystal layer 4 has a thickness which increases in proportion to one wavelength selected from a wavelength region in which transmission factors of the color layers are higher than 70% those at peaks of transmission spectra of the color layers. (See Appellants' specification, page 27, lines 9-13, and page 28, line 17 through page 29, line 3).

In accordance with another aspect of the invention, as illustrated in Figs. 19 and 21 an active matrix liquid display panel has an optical compensation layer 35 having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of the optical compensation layer on a plane of one of the substrates 10 being parallel to at least one of

polarization axes of two polarizing plates 5, 34, the optical compensation layer being disposed at least between the one transparent insulating substrate 10 and a corresponding one of the polarizing plates 5, 34. (See Appellants' specification, page 55, line 3 through page 60, line 20).

VI. ISSUES

1. Whether claims 1 and 2 are unpatentable over Oh-e et al. (Oh-e) in view of Shimizu et al. (Shimizu) and Ogawa et al. (Ogawa) under 35 U.S.C. §103(a).

2. Whether claim 3 is unpatentable over Utsumi et al. (Utsumi) under 35 U.S.C. §103(a).

3. Whether claims 4-6 are unpatentable over Utsumi in view of Shimizu under 35 U.S.C. §103(a).

4. Whether claim 7 is unpatentable over Utsumi in view of Yamahara et al. (Yamahara) under 35 U.S.C. §103(a).

5. Whether claims 8-15 are unpatentable over Utsumi and Yamahara and further in view of Wada et al. (Wada) under 35 U.S.C. §103(a).

VII. GROUPING OF CLAIMS

It is noted that the rejected independent claims 1, 3, 5 and 7 do not stand or fall together, but recite separately patentable features as set forth below (see pages 6-12 of Section VIII). Dependent claims 2, 4, 6 and 8-15 stands or falls together with their respective independent claim 1, 3, 5 and 7.

VIII. ARGUMENTS

With regard to claim 1, as explained in Appellants' Amendments filed October 16, 2002 and September 19, 2001, as well as the Responses filed March 19 and August 16, 2002, one of the features of the embodiment of Appellants' invention as claimed in claim 1, is changing the thickness of the liquid crystal layer in each color layer in order to efficiently control coloring when viewing from an oblique direction in the IPS mode liquid crystal display element having a wide view angle. Oh-e and Shimizu do not teach or suggest the structure for an active liquid matrix crystal display panel as claimed in Appellants' independent claim 1, "whereby an appearance of white color is gained by applying different driving voltages to the pixel electrodes, depending upon the different thickness of the liquid crystal display layers in each of the color layers" (Appellants' claim 1). Oh-e and Shimizu have nothing to do with the level of driving voltages applied to pixel electrodes.

The Examiner alleges that, since Ogawa discloses that "in the relatively thick cells, ... there is an undesirable phenomenon that the transmittance decreases as impressed voltage increases around the threshold voltage V_{th}" (Id., col. 7, lines 32-37), one skilled in the art would

be motivated to modify the combined teachings of Oh-e and Shimizu to apply larger voltage to each of the pixels for the color layers with thinner liquid crystal layer, as required by Appellants' claim 1.

Appellants submit that, Ogawa reference must be examined for what it teaches as a whole. The Examiner cannot pick and choose isolated statements in a reference to supply piece-meal the elements recited in Appellants' claim 1. In this regard, the Examiner's conclusion does not find any basis in Ogawa's actual disclosure when examined as a whole.

Ogawa describes the general principle of transmittance being a function of the wavelength and applied voltage, and provides a structure wherein "undesired wavelength-dependency of the transmittance is eliminated" (*Id.*, col. 7, lines 54-61 and col. 8, lines 2-7), Ogawa does not disclose or suggest an active matrix liquid crystal display panel configured for applying different driving voltages to the pixel electrodes, depending upon the different thickness of the crystal layers in each of the color layers, as required by Appellants' claim 1.

In fact, Ogawa discloses nothing more than a color liquid crystal display apparatus, modified to eliminate wavelength-dependency of the transmittance, wherein the same driving voltage is applied to all pixel electrodes irrespective of the thickness of the crystal layer (*see e.g., Id.*, col. 7, lines 10-27). The Examiner alleged that Ogawa discloses varying the level of the applied driving voltage because it discloses experimental data as a function of varying "impressed voltage". This allegation is not supported by Ogawa's actual disclosure.

Ogawa does not disclose or suggest anything other than conventional application of appropriate voltage above the threshold value V_{th} to electrodes 5a and 5b (see Ogawa, col. 2, lines 58-67, Fig. 4; and col. 6, lines 48-57). That is, Ogawa applies the same voltage value, via electrodes 5a and 5b (*see Id.*, Figs. 15, 16, 19-22, 27 and 28) to all three electrodes corresponding to R,G,B. On the other hand, Ogawa's Figs. 9(a) and (b) show the wavelength dependency of the transmission for a constant gap (5.7 μm) with voltage being varied (0V-4V). Therefore, Ogawa does not teach or suggest that the driving voltage should be varied when the gaps are changed for Red, Green and Blue. Further, as disclosed in Ogawa's column 7, lines 42-61, because of the multi-gaps, the Voltage-Transmittance curve for each of the wavelengths tends to be uniform as shown in Ogawa's Fig. 11. Accordingly, when the multi-gaps are applied to Twisted Nematic mode, it is completely useless to change the voltage for R, G and B (Red, Green, and Blue) respectively.

On the other hand, as explained in Appellants' specification, when the multi-gaps are applied to In Plane Switching mode, a driving voltage becomes generally larger, inversely proportional to the gaps. Therefore, in the case of In Plane Switching mode, it is necessary to increase the driving voltage correspondingly to the gap.

That is, when multi-gaps are applied to Twisted Nematic mode, driving voltage tends to shift so that driving voltages for R, G, B become equal to one another. Therefore, it is useless to use different voltages for maximum brightness for R, G, B.

Only when the multi-gaps are applied to In Plain Switching mode, the driving voltage becomes largely inversely proportional to the gaps.

Thus, contrary to the Examiner's analysis, Ogawa does not disclose, and is incapable of suggesting, applying different driving voltages to pixel electrodes depending upon the different thickness layers in each of the color layers, let alone applying larger voltage to each of the pixel electrodes for the color layer with thinner liquid crystal, as required by Appellants' claim 1.

Accordingly, Appellants' independent claim 1, as well as its dependent claim 2 (which incorporates all the novel and unobvious features of its base claim 1), would not have been obvious from any reasonable combination of Oh-e, Shimizu and Ogawa.

With regard to claim 3, Utsumi does not disclose different distances between pixel electrode and common electrode for different color filters. Instead, Utsumi discloses that "[i]n order to suppress the sudden decrease of the transmittance at the short wavelength region, it is effective to shift the peak wavelength to the short wavelength side by setting a wavelength λ to be shorter than 550nm under the condition $d_{eff}\Delta n(\lambda)=\lambda/2$ [where d_{eff} is thickness of the crystal layer]" (*Id.*, col. 5, lines 56-60). Nowhere does Utsumi disclose, teach or suggest spacing pixel electrodes and opposing electrodes by distances which are different for individual color layers, as required by Appellants' claim 3. The Examiner takes the position that in Utsumi pixel electrodes and corresponding opposing electrodes are arranged at different distances due to varying thickness of the corresponding color filters R,G,B. However, considering Utsumi's disclosure as a whole, nowhere (including col. 4, line 44 through col. 5, line 67 cited by the Examiner) does

Utsumi disclose or suggest that the spacing between <u>the pixel electrodes</u> and <u>opposing electrodes</u> has any relation to the thickness of color filters corresponding to the pixel electrodes. On the contrary, in every cross-sectional view which illustrates pixel electrodes and corresponding common (opposing) electrodes, Utsumi shows pixel electrodes and common electrodes arranged at identical distances from each other (see Id., Figs, 21(a) and 21(b)).

Thus, Appellants' claim 3 would not have been obvious from Utsumi at least for this reason.

With regard to claim 5, the Examiner alleges that, since Shimizu discloses that the thickness of the liquid crystal layer increases in proportion to the wavelength of the corresponding color filter, it would have been obvious to form a liquid crystal display panel wherein the liquid crystal layer has a thickness which is increased in proportion to one wavelength selected from a wavelength region in which transmission factors of the color layer are higher than 70% of those at peaks of transmission spectra of the color layer, as required by Appellants' claim 5. During an interview of June 9, 2003 with Appellants' representative, the Examiner indicate that this conclusion is based on the Examiner taking official notice that Shimizu's color filters must be such that they are able to pass 70% or more of peak of the incoming light.

However, the Examiner's position has no basis in Shimizu's actual disclosure which does not even mention how the transmission factors of its color filters relate to peaks of transmission spectra of the color layer, let alone teach or suggest the 70% requirement as recited in claim 5.

With regard to Appellants' claim 7, one of the features of the embodiment of Appellants' invention as claimed therein, is:

> an optical compensation layer having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of said optical compensation layer on a plane of one of said substrates being parallel to at least one of polarization axes of said two polarizing plates, said optical compensation layer being disposed at least between the one transparent insulating substrate and a corresponding one of said polarizing plates (claim 7).

The Examiner acknowledges that Utsumi does not disclose such a feature and relies on Yamahara to supply this acknowledged deficiency. In particular, Yamahara discloses a "phase difference plate negative in the refractive index anisotropy, with the principal refractive indices in the relation of nz=nc<nb" (*Id.*, col. 5, lines 29-31; see Fig. 1), arranged such that "the principal refractive index nb is inclined in the direction of arrow 20 at an angle θ around the y-axis about the normal direction of the surface (the z-axis in Fig. 1)" (*Id.*, col. 7, lines 22-25). Citing Fig. 4, the Examiner alleges that in Yamahara the axis of compensation layer (1) is parallel to the polarization axes of the polarizing plates (4) (see Office Action,. Paper No. 17, page 12, lines 1-2). However, like Fig. 1, Yamahara's Fig. 4 shows only that "the fast direction 25 which is the direction of the <u>minimum</u> principal refractive index na of the phase difference plate 1 [is] set to be parallel to [the transmission axis of polarizer 4]" (*see Id.* col. 7, lines 50-61, emphasis added).

That is, Yamahara does not disclose or suggest that its difference plate 1 has a <u>negative</u> refractive index anisotropy in any of its axis directions, and therefore, is incapable of disclosing or suggesting an arrangement wherein the projection of the direction of the axis having a

negative index anisotropy is parallel to the polarization axis of either of its polarizers 3 or 4. The Examiner's allegation that Yamahara's phase difference plate 1 has a negative refractive index is not supported by Yamahara's actual disclosure, nor does the Examiner explain how (or why) such a feature would have been taught or suggested by Yamahara.

Likewise, Wada does not disclose or suggest "an optical compensation layer having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of said optical compensation layer on a plane of one of said substrates being parallel to at least one of polarization axes of said two polarizing plates", as required by Appellants' claim 7. (see Wada, col. 5, line 48 through col. 6, line 25; see also Fig. 8).

With regard to Appellants' dependent claims 2, 4, 6 and 8-15, these claim incorporate, by reference, all the novel and unobvious features of their respective base claims. Thus, these claims would not have been obvious from any reasonable combination of the references applied by the Examiner at least for the reasons set forth above with respect to their respective base claims.

Accordingly, Appellants' claims 1-15 recite patentable novel an unobvious features, and thus, are not anticipated by any reasonable combination of the cited references.

The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Date: December 2, 2003

APPENDIX

CLAIMS 1- 15 ON APPEAL:

1. An active matrix liquid crystal display panel, comprising:

a first substrate on which a plurality of color layers having transmission wavelengths different from each other are provided in parallel to each other;

a second substrate disposed in an opposing relationship to said first substrate with a predetermine clearance left from said first substrate for generating a predetermined electric field when a predetermined voltage is applied; and

a liquid crystal layer formed from liquid crystal injected in a gap defined by a surface of said first substrate adjacent said second substrate and a surface of said second substrate adjacent said first substrate;

the electric field generated by said second substrate being substantially parallel to said liquid crystal layer to control a display;

said liquid crystal layer having a thickness which varies depending upon the transmission wavelengths of said color layers, whereby coloring is controlled in a case of an oblique view with respect to said first substrate and said second substrate,

wherein said second substrate comprises:

a plurality of pixel electrodes provided corresponding to said color layers, the predetermined voltage being applied to said pixel electrodes; and

a plurality of opposing electrodes provided in parallel to said pixel electrodes for each of said color layers for cooperating, when the voltage is applied to said pixel electrodes, with said pixel electrodes to generate the electric field therebetween,

whereby maximum brightness for each of R,G,B is gained by applying different driving voltages to the pixel electrodes, depending upon the thickness of the crystal layers in each of the color layers, wherein larger voltage is applied to each of the pixel electrodes for the color layers with thinner liquid crystal layer to get maximum brightness for each color.

2. An active matrix liquid crystal display panel as claimed in claim 1, wherein said liquid crystal layer has a thickness which increases in proportion to one wavelength selected from a wavelength region in which transmission factors of said color layers are higher than 70% those at peaks of transmission spectra of said color layers.

3. An active matrix liquid crystal display panel, comprising:

a first substrate on which a plurality of color layers having transmission wavelengths different from each other are provided in parallel to each other;

a second substrate disposed in an opposing relationship to said first substrate with a predetermined clearance left from said first substrate for generating a predetermined electric field when a predetermined voltage is applied; and

a liquid crystal layer formed from liquid crystal injected in a gap defined by a surface of

said first substrate adjacent said second substrate and a surface of said second substrate adjacent said first substrate;

the electric field generated by said second substrate being substantially parallel to said liquid crystal layer to control a display;

said liquid crystal layer having a thickness which varies depending upon the transmission wavelengths of said color layers,

wherein said second substrate includes

a plurality of pixel electrodes provided corresponding to said color layers, the predetermined voltage being applied to said pixel electrodes, and

a plurality of opposing electrodes provided in parallel to said pixel electrodes for each of said color layers for cooperating, when the voltage is applied to said pixel electrodes, with said pixel electrodes to generate the electric field therebetween,

said pixel electrodes and said opposing electrodes being spaced from each other by distances which are different for the individual color layers.

4. An active matrix liquid crystal display panel as claimed in claim 3, wherein said first substrate has a protective layer provided on a surface thereof adjacent said second substrate for preventing elusion of impurities from said color layers.

5. An active matrix liquid crystal display panel, comprising:

a first substrate on which a plurality of color layers having transmission wavelengths different from each other are provided in parallel to each other;

a second substrate disposed in an opposing relationship to said first substrate with a predetermined clearance left from said first substrate for generating a predetermined electric field when a predetermined voltage is applied; and

a liquid crystal layer formed form liquid crystal injected in a gap defined by a surface of said first substrate adjacent said second substrate and a surface of said second substrate adjacent said first substrate;

the electric field generated by said second substrate being substantially parallel to said liquid crystal layer to control a display;

said liquid crystal layer having a thickness which varies depending upon the transmission wavelength of said color layers,

wherein said liquid crystal layer has a thickness which is increased in proportion to one wavelength selected from a wavelength region in which transmission of factors of said color layer are higher than 70% of those at peaks of transmission spectra of said color layers; and

wherein said second substrate includes

a plurality of pixel electrodes provided corresponding to said color layers, the predetermined voltage being applied to said pixel electrodes, and

a plurality of opposing electrodes provided in parallel to said pixel electrodes for each of

said color layers for cooperating, when the voltage is applied to said pixel electrodes, with said pixel electrodes to generate the electric field therebetween,

said pixel electrodes and said opposing electrodes being spaced from each other by distances which are different for the individual color layers.

6. An active matrix liquid crystal display panel as claimed in claim 5, wherein said first substrate has a protective layer provided on a surface thereof adjacent said second substrate for preventing elusion of impurities from said color layers.

7. An active matrix liquid crystal display panel, comprising:

a plurality of scanning lines and a plurality of signal lines disposed in an intersecting relationship with each other like gratings on one of a pair of transparent insulating substrates, a plurality of active elements individually provided in the proximity of intersecting points of said scanning lines and said signal lines, a plurality of pixel electrodes connected to said active elements, a plurality of opposing electrodes disposed corresponding to said pixel electrodes, a voltage being applied between said pixel electrodes and said opposing electrodes, a liquid crystal layer disposed between the one transparent insulating substrate and the other transparent insulating substrate, a pair of polarizing plates disposed on the outer sides of said transparent insulating substrates, and a mechanism for controlling a display with an electric field substantially parallel to said liquid crystal layer; and

an optical compensation layer having a negative refractive index anisotropy in a one axis direction, a projection of the anisotropic axis of said optical compensation layer on a plane of one of said substrates being parallel to at least one of polarization axes of said two polarizing plates, said optical compensation layer being disposed at least between the one transparent insulating substrate and a corresponding one of said polarizing plates.

8. An active matrix liquid crystal display panel as claimed in claim 7, wherein, when the voltage between said pixel electrodes and said opposing electrodes is 0, angles formed by directors of liquid crystal molecules in said liquid crystal layer with respect to a plane of said liquid crystal layer are substantially uniform, and the refractive index anisotropic axis of said optical compensation layer extends substantially in parallel to said directors.

9. An active matrix liquid crystal display panel as claimed in claim 7, wherein a product $\Delta n_{LC} \cdot d_{LC}$ of a refractive index anisotropy Δn_{LC} and a layer thickness d_{LC} of said liquid crystal layer is substantially equal to a product $\Delta n_F \cdot d_F$ of the refractive index anisotropy Δn_F and a layer thickness d_F of said optical compensation layer.

10. An active matrix liquid crystal display panel as claimed in claim 7, wherein a refractive index n_{L0} of said liquid crystal layer for ordinary light and a refractive index n_{F0} of said optical compensation layer for ordinary light are substantially equal to each other.

11. An active matrix liquid crystal display panel as claimed in claim 7, wherein,

when a potential difference between said pixel electrodes and said opposing electrodes is 0, projections of directors of liquid crystal molecules in said liquid crystal layer on a plane of said liquid crystal layer are substantially parallel to each other and a projection of the refractive index anisotropic axis of said optical compensation layer on the plane of said liquid crystal layer is parallel to the projections of said directors on the plane of said liquid crystal layer, and

where an angle of the refractive index anisotropic axis of said optical compensation layer with respect to the plane of said liquid crystal layer is represented by θ_F and angles between said directors and the plane of said liquid crystal layer on interfaces between said liquid crystal layer and said insulating substrates are represented by θ_1 and θ_2, θ_1 and θ_2 being different from each other, the angle θ_F satisfies $\theta_1 < \theta_F < \theta_2$ or $\theta_2 < \theta_F < \theta_1$, and the refractive index anisotropic axis of said optical compensation layer is parallel to the director of at least one of the liquid crystal molecules in said liquid crystal layer.

12. An active matrix liquid crystal display panel as claimed in claim 7, wherein, when a potential difference between said pixel electrodes and said opposing electrodes is 0, projections of directors of liquid crystal molecules in said liquid crystal layer on a plane of said liquid crystal layer are substantially parallel to each other and a projection of the refractive index anisotropic axis of said optical compensation layer on the plane of said liquid crystal layer is

parallel to the projections of said directors on the plane of said liquid crystal layer, and

where an angle of the refractive index anisotropic axis of said optical compensation layer with respect to the plane of said liquid crystal layer is represented by θ_F and angles between said directors and the plane of said liquid crystal layer on interfaces between said liquid crystal layer and said insulating substrates are represented by θ_1 and θ_2, θ_1 and θ_2 being different from each other, the angle θ_F always satisfies $\theta_1 < \theta_F < \theta_2$ or $\theta_2 < \theta_F < \theta_1$ and the angle θ_F varies in a thicknesswise direction of said optical compensation layer in a corresponding relationship to a variation of the director in the thicknesswise direction of said liquid crystal layer.

13. An active matrix liquid crystal display panel as claimed in claim 8, wherein a product of a $\Delta n_{LC} \cdot d_{LC}$ of a refractive index anisotropy Δn_{LC} and a layer thickness d_{LC} of said liquid crystal layer is substantially equal to a product $\Delta n_F \cdot d_F$ of the refractive index anisotropy Δn_F and a layer thickness d_F of said optical compensation layer.

14. An active matrix liquid crystal display panel as claimed in claim 8, wherein a refractive index nLO of said liquid crystal layer for ordinary light and a refractive index n_{F0} of said optical compensation layer for ordinary light are substantially equal to each other.

15. An active matrix liquid crystal display panel as claimed in claim 9, wherein a refractive index nLO of said liquid crystal layer for ordinary light and a refractive index n_{F0} of said optical compensation layer for ordinary light are substantially equal to each other.